National Institute of Environmental Health Sciences

Exposure to multiple metals from groundwater - A global crisis: Geology, climate change, health effects, testing, and mitigation

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Abstract:

This paper presents an overview of the global extent of naturally occurring toxic metals in groundwater. Adverse health effects attributed to the toxic metals most commonly found in groundwater are reviewed, as well as chemical, biochemical, and physiological interactions between these metals. Synergistic and antagonistic effects that have been reported between the toxic metals found in groundwater and the dietary trace elements are highlighted, and common behavioural, cultural, and dietary practices that are likely to significantly modify health risks due to use of metal-contaminated groundwater are reviewed. Methods for analytical testing of samples containing multiple metals are discussed, with special attention to analytical interferences between metals and reagents. An overview is presented of approaches to providing safe water when groundwater contains multiple metallic toxins. © 2011 The Royal Society of Chemistry.

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Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Food/Water Quality

Food/Water Quality: Chemical

Geographic Feature:

resource focuses on specific type of geography

Freshwater

Geographic Location:

resource focuses on specific location

Non-United States, United States

Non-United States: Africa, Asia, Europe, Central/South America, Non-U.S. North America

African Region/Country: African Country

Other African Country: Uganda;Burkina Faso;Mali;Ghana

Asian Region/Country: China, India, Other Asian Country

Other Asian Country: Taiwan;Malaysia;Cambodia;Vietnam;Bangladesh;Iran

European Region/Country: European Country

Other European Country : Finland;Italy;Greece

Health Impact: ☑

specification of health effect or disease related to climate change exposure

Cancer, Cardiovascular Effect, Dermatological Effect, Developmental Effect, Diabetes/Obesity, Injury, Neurological Effect, Respiratory Effect, Urologic Effect, Other Health Impact

Developmental Effect: Cognitive/Neurological, Reproductive

Other Health Impact: Heavy metal toxicity

Mitigation/Adaptation: ☑

mitigation or adaptation strategy is a focus of resource

Adaptation

Population of Concern: A focus of content

Population of Concern: ☑

populations at particular risk or vulnerability to climate change impacts

Children, Elderly, Low Socioeconomic Status, Pregnant Women

Resource Type: ☑

format or standard characteristic of resource

Review

Timescale: ☑

time period studied

Time Scale Unspecified

Vulnerability/Impact Assessment: ☑

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content